

**WHAT IS CLAIMED IS:**

- 1 1. An apparatus which holds an optical fiber in alignment to an optical device, said  
2 apparatus comprising:
  - 3 a fiber holder having a first plurality of indentations formed therein;
  - 4 an optical fiber within one of said first plurality of indentations;
  - 5 a base substrate having a second plurality of indentations formed into said base;
  - 6 a plurality of spacers, each of said plurality of spacers within a corresponding  
7 one of the second plurality of indentations, wherein said fiber holder is mounted on said  
8 base with said plurality of spacers within said first plurality of indentations; and  
9 an optical device mounted to said base.
- 1 2. The apparatus of claim 1 wherein the optical device comprises a lens.
- 1 3. The apparatus of claim 1 wherein the first plurality of indentations includes an  
2 elongated groove, and wherein said optical fiber is held within the elongated groove.
- 1 4. The apparatus of claim 1 wherein the second plurality of indentations includes at least  
2 one trapezoidal-shaped pocket.
- 1 5. The apparatus of claim 4 wherein the second plurality of indentations includes an  
2 elongated groove, and wherein said optical device comprises a lens mounted to said base  
3 within the elongated groove.
- 1 6. The apparatus of claim 1 wherein at least one of said plurality of spacers are  
2 spherically-shaped.
- 1 7. The apparatus of claim 6 wherein at least one of said plurality of spacers and said  
2 optical device are made of the same material.
- 1 8. The apparatus of claim 7 wherein the first plurality of indentations includes at least  
2 one trapezoidal-shaped pocket.

1 9. The apparatus of claim 1 wherein the second plurality of indentations includes at least  
2 one trapezoidal-shaped pocket.

1 10. The apparatus of claim 9 further comprises:

2 a single spacer mounted within one of said second plurality of indentations,  
3 wherein said fiber holder is mounted to said base in contact with said single spacer at an  
4 end of said fiber holder and establishes a horizontal position of said fiber holder.

1 11. The apparatus of claim 9 wherein one of the second plurality of indentations is  
2 formed to a different depth than a second of the second plurality of indentations.

1 12. The apparatus of claim 2 wherein said base further comprises:

2 a third plurality of indentations formed in said base; and  
3 a second plurality of spacers, each of said second plurality of spacers within a  
4 corresponding one of said third plurality of indentations, wherein said optical device is  
5 mounted to said base in contact with at least two of said second plurality of spacers and  
6 establishes a horizontal position of said optical device.

1 13. The apparatus of claim 12 wherein said optical device has a round central section.

1 14. The apparatus of claim 12 wherein the optical device comprises one of a dome-  
2 shaped lens and a disk-shaped lens.

1 15. The apparatus of claim 2 wherein said base further comprises:

2 a third plurality of indentations formed in said base; and  
3 a second plurality of spacers, each of said second plurality of spacers within a  
4 corresponding one of said third plurality of indentations, wherein said optical device is  
5 mounted to said base in contact with at least three of said second plurality of spacers and  
6 establishes a vertical position of said optical device.

1 16. The apparatus of claim 15 wherein said optical device has at least one flat face.

1 17. The apparatus of claim 15 wherein said optical device comprises one of a dome-  
2 shaped lens and a disk-shaped lens.

1 18. The apparatus of claim 1 wherein the second plurality of indentations formed in said  
2 base includes at least one indentation located adjacent to an edge of said base, and  
3 wherein one of said plurality of spacers held within the one indentation adjacent to the  
4 edge of said base protrudes beyond the edge of said base and establishes a known  
5 distance from a contact point on said spacer to a point on said base.

1 19. The apparatus of claim 18 wherein the one indentation adjacent to the edge of said  
2 base is a trapezoidal-shaped pocket, and wherein the one of said plurality of spacers held  
3 within the one indentation adjacent to the edge of said base contacts an interior wall of  
4 the trapezoidal-shaped pocket.

1 20. An apparatus which holds a plurality of optical fibers in alignment to a plurality of  
2 optical devices, said apparatus comprising:  
3 a fiber holder having a first plurality of indentations formed therein;  
4 a plurality of optical fibers, each of said plurality of fibers within a corresponding  
5 one of the first plurality of indentations;  
6 a base substrate having a second plurality of indentations formed into said base;  
7 a plurality of spacers, each of said plurality of spacers within a corresponding  
8 one of the second plurality of indentations, wherein said fiber holder is mounted on said  
9 base with said plurality of spacers within said first plurality of indentations; and  
10 a plurality of optical devices mounted to an end of said fiber holder wherein each  
11 of said plurality of optical devices are aligned with a one of said plurality of optical  
12 fibers.

1 21. The apparatus of claim 20 wherein at least one of said plurality of optical devices  
2 comprises a lens.

1 22. A method of aligning optical devices comprising:

2 mounting a first optical device on a first base having a partial indentation formed  
3 in an edge of said first base that holds a spacer to protrude beyond the edge of said first  
4 base and establishes a known distance from a point on the spacer to the first optical  
5 device;

6 mounting a second optical device on a second base; and

7 aligning the second optical device to the first optical device by placing the  
8 second base to contact the spacer held in the first base.